NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive, P.O. Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.nmenv.state.nm.us

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

Memorandum

To: **LaDonna Turner, Site Assessment Manager**
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: **Dana Bahar, Manager, Superfund Oversight Section**
Ground Water Quality Bureau, New Mexico Environment Department

Date: **October 8, 2010**

Subject: **Pre-CERCLIS Screening Assessment of the Mary No. 1 Mine (Grants Mining District), McKinley County, New Mexico: Further action under CERCLA recommended**

Site name Mary No. 1 **Alternative names** Section 1 NWQ, Dysart No. 3
Street address not applicable **City** not applicable **State** New Mexico
Zip code not applicable **County** McKinley
Latitude 35.46247 **Longitude** -107.87216 **TRS** T14N, R10W, Sec. 11/NW/NE

Site physical description:
The Mary No. Mine ("Site") is located approximately 9.3 miles northwest of the junction of State highways 509 and 605 (Ref. 1). The Site is located in the Ambrosia Lake 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.46247, longitude 107.87216, and elevation approximately 7,100 ft above sea level. The total area of the Site is 33.88 acres. The area that potentially has been disturbed from mining activities appears to be less than a few acres (Ref. 2). Access to the Site is required by permission from the private landowner of the property and the adjacent property owner whose gravel road is used to drive to the Site through a locked gate (Ref. 1). Figures 1-3 from the Intera 2010 report are contained in Attachment A.

The Mary No. 1 Mine is located approximately 2,300 ft north of the Dysart Mine No. 1 site along the northern side of the ephemeral drainage named Martin Draw (Ref. 3). Martin Draw extends southeastward to join Arroyo del Puerto near the northwest end of the Rio Algom Mill Site. The Arroyo del Puerto continues southeastward until it joins San Mateo Creek below the Highway 509-605 junction.

Anderson visited the Site in 1980 and found a 500 ft deep shaft that had caved in and formed a 75 ft by 75 ft deep subsidence hole (Ref. 4). Waste rock extends 600 ft from the shaft opening and a small powder magazine structure was also present. Information on the current site physical description is summarized from the report of

a site visit on April 9, 2010 conducted by a subcontractor as part of an Abandoned Uranium Mine site assessment report for the Mining and Mineral Division of the New Mexico Energy, Minerals and Natural Resources Department (Ref. 1).

No pits or open cuts were found at the Site. One disturbed area consists of a low, flat-top mound of dirt 60 ft wide X 90 ft long X 2 ft high. A vent shaft is located in the center of this low lying mound of dirt. The vent shaft contains a PVC pipe within a large metal casing. Photographs 1-6 from the Intera 2010 report are contained in Attachment B.

Reclamation activities had taken place at the Site after the 1980 site visit according to information from Mr. Al Cox with Homestake Mining Company (Ref. 1). The post 1980 reclamation work included filling in the caved shaft, removal of the powder magazine, and removal of waste piles.

Site identification:
The Site is one of numerous legacy uranium sites within the Grants Mining District, Ambrosia Lake Subdistrict, San Mateo Creek watershed, Bluewater Underground Basin.

Site summary:
The Mary No. 1 mine shaft was sunk in 1959 and was last registered at the State Mine Inspector's Office in 1966. The target rock was the Westwater Canyon Member of the Jurassic Morrison Formation. The mine yielded 357,262 tons of ore and 794,063 lbs of uranium oxide concentrate (U_3O_8; Ref. 5).

One disturbed area consists of a low, flat-top mound of dirt 60 feet (ft) wide X 90 ft long X 2 ft high. The maximum gamma radiation measurement at this mound is 19 µR/hr at 4 ft above the ground surface (ags). Background surface radiation readings indicated 16 µR/hr at surface and 4 ft ags. The maximum gamma radiation reading at the Site was 45 µR/hr at surface.

Targets:
The Site is located within a few hundred feet of a small unnamed drainage that flows NW-SE to join with Martin Draw in a distance of approximately 2,000 ft. Martin Draw eventually joins the Arroyo del Puerto. The Arroyo del Puerto eventually joins the San Mateo Creek drainage. Some portion of contaminants from the Site may adhere to sediments, and propagate episodically downgradient in response to stream flows within Martin Draw, Arroyo del Puerto, and San Mateo Creek. Current details of alluvial ground water flow are unknown, but are thought to follow general topographic slope. Alluvial groundwater adjacent to and downgradient from the Site may propagate into underlying bedrock aquifers through stratigraphic, structural, and/or anthropogenic connections (e.g., leaky wells, mine shafts). Distance to the Site from the end of Highway 509 is approximately two miles.

Well records from the New Mexico Office of the State Engineer that are located within a four-mile radius of the Site are shown in Table 1 (Ref. 6).

Site ownership and Potential Responsible Parties
The history of Site ownership-operation and potentially responsible parties information includes the following. From 1958 to 1959 Boyles Brothers Drilling Company, of Salt Lake City, constructed the shaft as contractors to Stella Dysart and Entrada Corporation, both of Albuquerque. From 1959 to 1961 Boyles Brothers Drilling Co operated the Site under contract to Entrada Corporation. From 1961-1963 Entrada Corporation operated the Site as contractors to Stella Dysart. In 1964 Stella Dysart controlled the Site. The site was sold to Homestake-Sapin Partners on June 12, 1964. Homestake-Sapin Partners operated the Site from 1964 to 1966. Mining ceased during calendar year 1966. In 1980 United Nuclear-Homestake Partners controlled the mine, but no active mining occurred under their operational period (Ref. 2 and 5).

Site aliases during operation include the Entrada-Dysart No. 1, Entrada Boyles Shaft and Dysart No. 3.

File review:
Files and information sources that were reviewed for this assessment are listed below.

Site reconnaissance:
A field visit-site assessment was performed at the Site on April 10, 2010 by a contractor to the New Mexico

Energy, Minerals, and Natural Resources Department under the Abandoned Uranium Mine (AUM) Program. The resultant report summarizing their findings is dated May 28, 2010.

Recommendation:
Additional investigation of the Site under CERCLA authority is recommended to assess any physical hazards as well as the areal extent of elevated radioactivity readings noted in the most recent Site reconnaissance to determine if threats to human health and the environment exist. NMED also recommends assessment of sediments in surface water drainages originating or crossing this Site to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water impacts from "dry" mines such as this Site initially would impact the alluvial ground water system through leaching of on-site waste materials and ore stockpiles. Such impacts, if they exist, predominantly may be localized to alluvial ground water in the vicinity of the Site from leaching prior to Site reclamation. Alternatively ground water impacts may be more widespread, contributing to the overall potential degradation of the alluvial ground water regionally, as well as potentially to impacts to ground water in underlying bedrock aquifers. A generalized investigation of potential alluvial ground water impacts from "dry" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Depending upon the results of this investigation, additional site-specific alluvial ground water characterization might be considered.

NMED does recommend that the Mary No. 1 Mine be considered for inclusion in a district wide sediment and/or ground water investigation in order to characterize current conditions and the potential for materials left on-site to impact alluvial and/or bedrock ground water quality if environmental or active land use conditions should change.

References:
1. Intera Inc., May 28, 2010. "Abandoned uranium mine assessment for the Mary No. 1 site (NM0095)." Prepared for the New Mexico Energy, Minerals and Natural Resources Department 24 pp.
2. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
3. USGS, 1957. Ambrosia Lake, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
4. Anderson, Orin J., 1980(?). "Abandoned or inactive uranium mines in New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 148.
5. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.
6. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.
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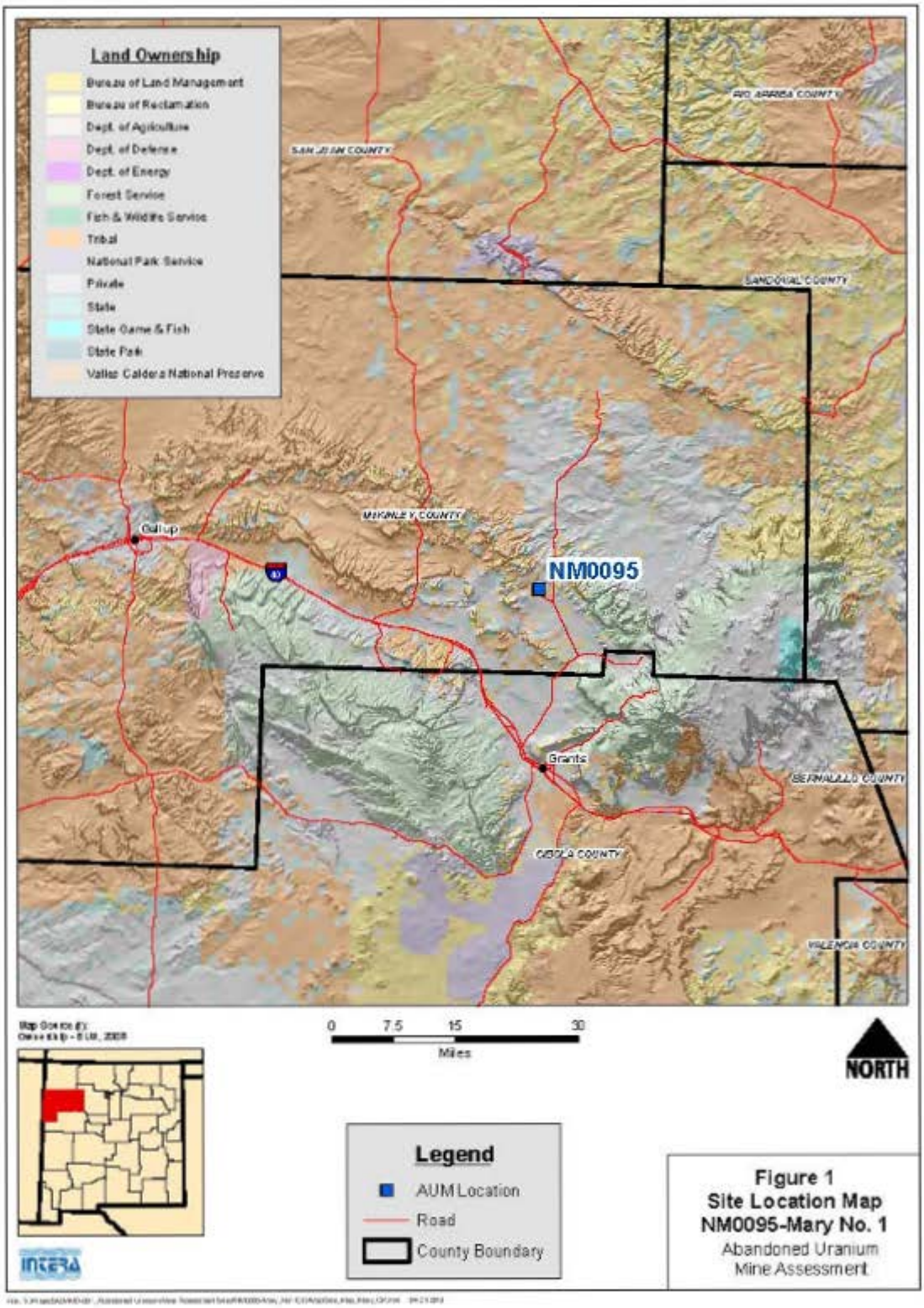
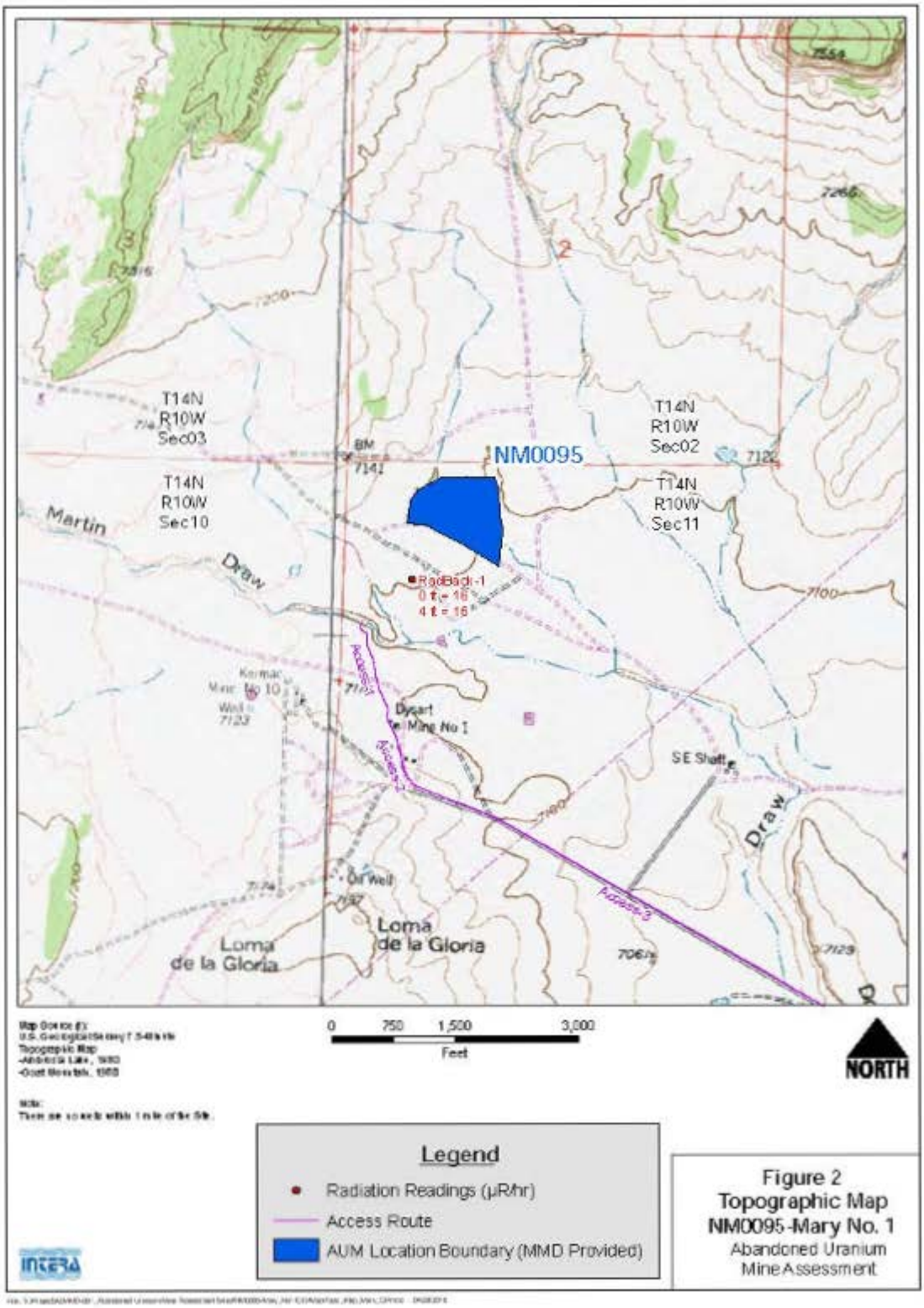
Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the Mary No. 1 Mine Site, Grants Mining District, New Mexico.

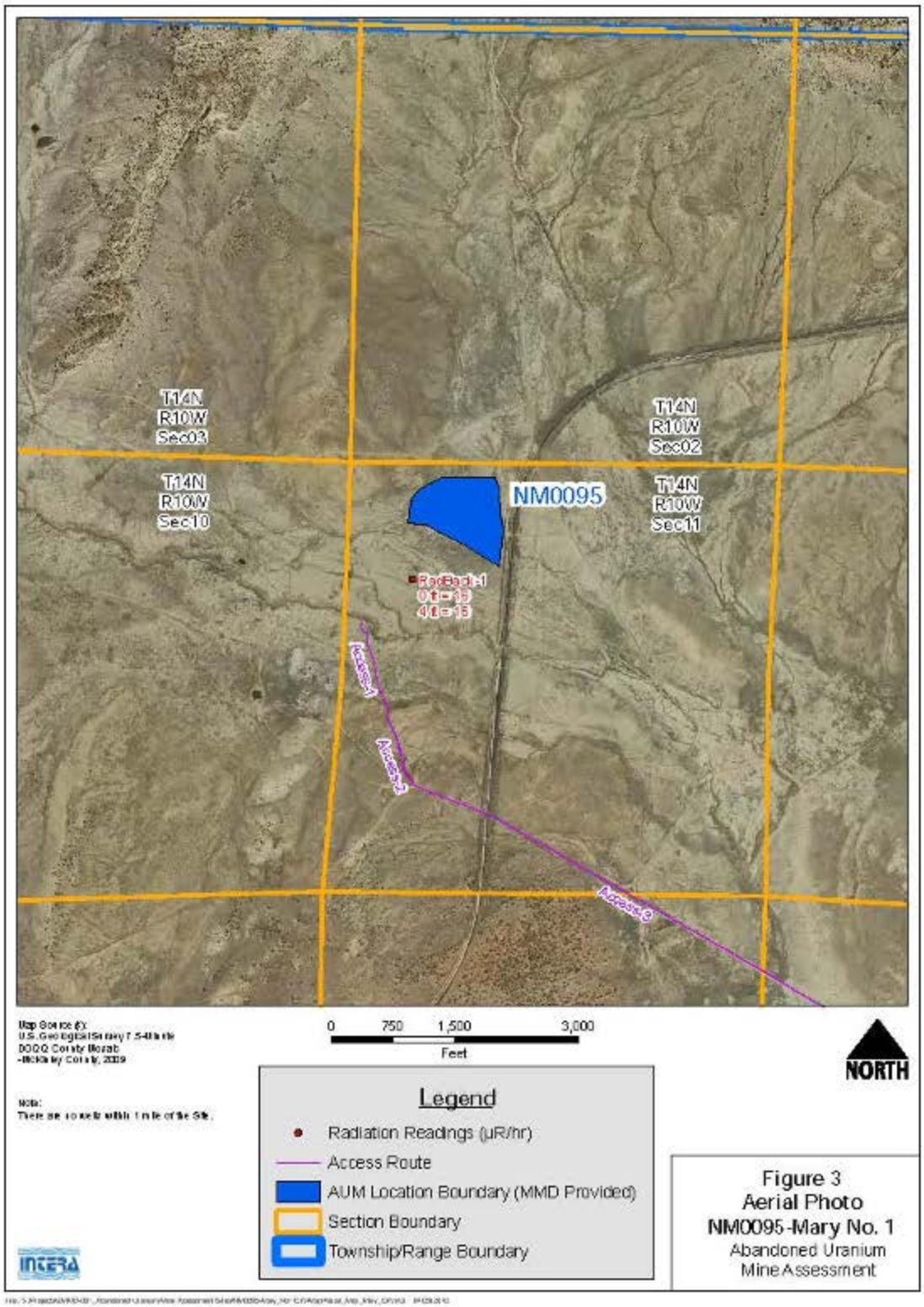
distance from site (miles)	POD REC NB	POD BASIN	POD NBR	well completion date	DEPTH WELL (ft)	DEPTH WATER (ft)	CASING SIZE (in)	owner name	USE	diversion acre/ft yr
0 - 0.25										
0.25 - 0.50										
0.50 - 0.75										
0.75 - 1.0										
1.0 - 2.0	522	B	00143	7/18/1960	90.00	60.00	0.00	(b) (6)	Domestic	3
1.0 - 2.0	354	B	00373	12/31/1956	1003.00	0.00	13.38	RIO ALGOM MINING LLC	Mining	0
1.0 - 2.0	1225	B	00994	1/2/1958	827.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	620	B	00362	11/30/1956	3093.00	0.00	10.75	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	29	B	00363	4/30/1956	745.00	0.00	4.50	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	785	B	00366	12/31/1955	760.00	0.00	4.50	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	1490	B	00372	9/12/1956	796.00	0.00	8.63	SABRE-PINON CORPORATION	Mining	0
2.0 - 3.0	532	B	00994	9/18/1958	857.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	1167	B	01087	5/25/1985	651.00	566.00	5.00	(b) (6) BROTHERS	Stock	3
2.0 - 3.0	436	B	01246	4/29/1992	1200.00	700.00	6.63	(b) (6)	Stock	3
3.0 - 4.0	97	B	00364	8/31/1956	735.00	0.00	6.00	ANDERSON DEVELOPMENT CORP.	Mining	0
3.0 - 4.0	851	B	00365	1/31/1956	793.00	0.00	6.63	ANDERSON DEVELOPMENT CORP.	Mining	0
3.0 - 4.0	183001	B	00371	8/25/1956	752.00	0.00	8.63	SABRE-PINON CORPORATION	Mining	0
3.0 - 4.0	1285	B	00522	2/7/1978	70.00	0.00	0.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitor Well	0
3.0 - 4.0	180648	B	00522	2/7/1978	70.00	0.00	5.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitor Well	0
3.0 - 4.0	71	B	00771	2/2/1980	2070.00	1025.00	7.00	PATHFINDER MINES CORP.	Prospecting	0
3.0 - 4.0	378	B	00994	3/23/1968	810.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
3.0 - 4.0	823	B	00994	3/16/1970	779.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
3.0 - 4.0	1428	B	00994	4/5/1959	1094.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
POD REC NBR: point of diversion record number.				B: Bluewater Basin						
POD BASIN: point of diversion basin										
POD NBR: point of diversion number										

Attachment A

Figures 1, 2, and 3 from Intera, 2010 report


Land Ownership
Bureau of Land Management
Bureau of Reclamation
Dept. of Agriculture
Dept. of Defense
Dept. of Energy
Forest Service
Fish & Wildlife Service
Tribal
National Park Service
Private
State
State Game & Fish
State Park
Valles Caldera National Preserve
RIO ARRIBA COUNTY
SAN JUAN COUNTY
SANDOVAL COUNTY
MCKINLEY COUNTY
Gallup
NM0095
Grants
CIBOLA COUNTY
VALENCIA COUNTY
0 7.5 15 30
Miles
NORTH
Legend
AUM Location
Road
County Boundary
Figure 1
Site Location Map
NM0095-Mary No. 1
Abandoned Uranium
Mine Assessment


T14N
R10W
Sec03
T14N
R10W
Sec10
T14N
R10W
Sec02
T14N
R10W
Sec11
NM0095
Martin
Draw
RadBadi-1
0 ft = 16
4 ft = 16
Dysart
Mine No 1
SE Shaft
Oil Well
Loma
de la Gloria
Loma
de la Gloria
0
750
1,500
3,000
Feet
NORTH
Legend
Radiation Readings (µR/hr)
Access Route
AUM Location Boundary (MMD Provided)
Figure 2
Topographic Map
NM0095-Mary No. 1
Abandoned Uranium
Mine Assessment


T14N
R10W
Sec03
T14N
R10W
Sec02
T14N
R10W
Sec10
NM0095
T14N
R10W
Sec11
RadBack-1
0 ft = 15
4 ft = 15
Access-1
Access-2
Access-3
0
750
1,500
3,000
Feet
NORTH
Legend
Radiation Readings (uR/hr)
Access Route
AUM Location Boundary (MMD Provided)
Section Boundary
Township/Range Boundary
Figure 3
Aerial Photo
NM0095-Mary No. 1
Abandoned Uranium
Mine Assessment

Attachment B

Photo Log from Intera 2010 report

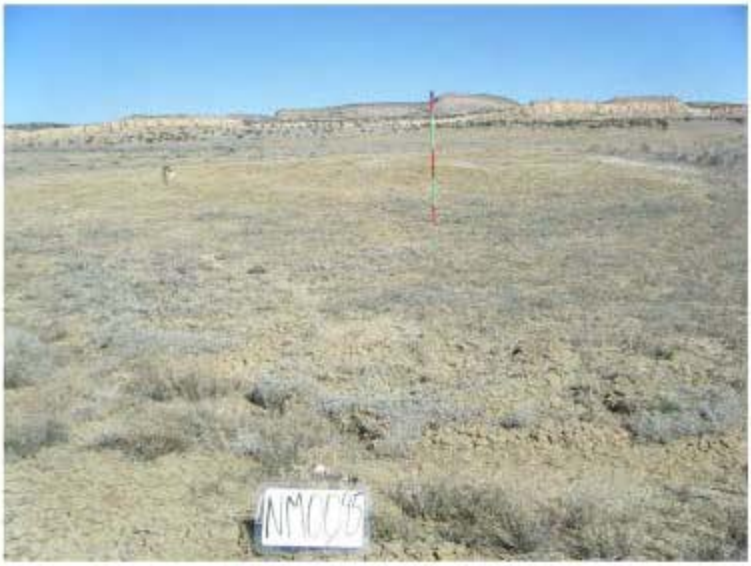


Photo 1-Site photo, looking northwest.

Photo 2-Looking northwest at DistPly-1.

Photo 3-Looking southwest at DistPly-1.

Photo 4-A vent shaft (MiscPt-1) in DistPly-1.

Photo 5-View down vent shaft (MiscPt-1).

Photo 6-At MMD provided shapefile location, looking north.